

REMARKS

As a preliminary matter, the Title of the Invention has been amended as requested by the Examiner. Entry and approval of the new Title are respectfully requested.

As a second preliminary matter, claim 12 stands objected to for informalities. Accordingly, the typographical error noted by the Examiner has been corrected, and withdrawal of this objection in light of this amendment is respectfully requested.

Claims 1, 4-8, and 11-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art ("the AAPA") in view of Horn ("Basic Electronics Theory" 4th Edition, pages 478-487) and Benes et al. (US 4,817,430). Applicant respectfully traverses this rejection because none of the cited references, whether taken alone or in combination, discloses or suggests filtering or converting an output signal from a crystal oscillator into a nearly ideal sine wave having the oscillation frequency, and before inputting this nearly ideal sine wave into a pulse converter, as in the present invention, as amended.

As recognized by the Examiner on page 2 of paper no. 2, the AAPA fails to show the output from a crystal oscillator connected to a filter equal to the oscillation frequency, or the output of such a filter being connected to the input of a pulse converter. Similarly, the Examiner does not assert that Horn discloses such a circuit either. Horn is cited only for recognizing that a totally harmonic-free sine wave is difficult to achieve.

(Page 3, Paragraph 3 of Paper No. 2). Applicant wishes to point out to the Examiner, however, that Horn specifically identifies such a problem for all sine wave oscillators in general, but does not identify any specific problem related to crystal oscillators, among the many other kinds of oscillators described by Horn. Accordingly, Applicant submits that Horn does not identify the specific problem or solution addressed by the present invention, which is drawn toward crystal oscillators.

Applicant further wishes to emphasize that the Examiner does not assert that Horn teaches or suggests any features or elements of any of the claims of the present invention. The Examiner cites only Benes for teaching a filter or converter between the output of a crystal oscillator and the input of a pulse converter. As discussed below, however, Benes neither teaches nor suggests such features as in the present invention.

Benes is specifically drawn to a system for determining the thickness of varying material coatings. Such a system relates to thin coating technology used in semiconductors in optical fields, and for measuring the thickness of coatings and coating speeds. As a first issue therefore, Applicant submits that Benes does not address the specific problems and solutions presented by the present invention relating to crystal oscillators.

Figure 6 of Benes does not describe the features of the present invention as asserted by the Examiner. Figure 6 of Benes shows a circuit 1 provided with a harmonic filter 32. Benes specifically discloses that the filter 32 filters out the third harmonic of the oscillator 2 because this harmonic has the greatest amplitude according to a Fourier

analysis. (See column 7, lines 39-43). Benes further specifically discloses that the frequency of the crystal oscillator is 6 MHz, but the frequency range of the harmonic filter 32 is set to a range of 15-18 MHz, and preferably 16.5 MHz. (See column 7, lines 44- 51). In other words, Benes specifically teaches that the filter 32, as identified by the Examiner, is not set to the frequency of the crystal oscillator.

In contrast, claim 1 of the present invention recites, among other things, that the sine wave output from a crystal oscillator having an oscillation frequency f is passed through a filter equal to that oscillation frequency f before being input into a pulse converter. Independent claims 6 and 11-12 have been amended to clarify features similar to these features as in claim 1. The present invention is therefore significantly different than that disclosed by Benes.

The filter of the present invention has a filter equal to the oscillation frequency, of the crystal oscillator whereas Benes teaches a filter designed for frequency range of a harmonic several times greater than the frequency of the crystal oscillator. Furthermore, Benes specifically teaches away from the present invention in that the harmonic filter 32 is described to be designed as a "relatively broad band-pass filter," which has to accommodate changes in the harmonic frequency which occur with increasing coating loads. (Col. 7, lines 22-25). Accordingly, the filter 32 does not even address the output of the crystal oscillator itself, as featured in the present invention, but instead is designed to accommodate the changing and increasing coating loads which are the primary focus of the disclosure of Benes. Any reference which teaches away from

the present invention cannot form the basis of a rejection base on obviousness, and Applicant accordingly traverses for at least these reasons. Because none of the three cited references alone or in combination teach or suggest a filter or converter equal to the oscillation frequency of the crystal oscillator, Applicant respectfully request that the Section 103 rejection based on a combination of the AAPA, Horn, and Benes be withdrawn.

Claims 2-3 and 9-10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the AAPA in view of Horn and Benes, and further in view of Inao et al. (US 5,382,929) and Gibilisco ("Handbook of Radio and Wireless Technology" pages 175-197). Applicant respectfully traverses this rejection for at least the reasons discussed above in traversing the rejection of the independent claims. Claims 2 and 3 depend directly or indirectly from independent claim 1, and claims 9 and 10 depend from independent claim 6, and therefore these claims contain all of the features of all of their respective base claims, plus additional features. Applicants further traverse as follows:

Inao discloses a monolithic crystal filter which provides a stopband attenuation to raise shock resistance with a high electric conductivity. (See column 1, lines 5-9). Applicant notes that the Examiner has cited Inao merely for teaching that band-pass filters may be used with crystal filters, but not for teaching or suggesting any specific features or elements of the claims of the present invention. Other than the fact that both address crystal oscillators, Applicant submits that there is no other relation between Inao and the claims of the present invention.

Gibilisco merely discloses a general crystal oscillation circuit, and teaches the well-known principle that the frequency of the crystals can be determined mainly by the thickness of the crystal, and by the angle at which the crystal is cut from quartz rock. (Pages 195-197). Applicant wishes to point out to the Examiner that this portion of text from Gibilisco merely describes the frequency of the crystals themselves, and is entirely unrelated to *filters used in combination* with such crystals. Applicant further notes that Gibilisco is not cited for teaching or suggesting any specific features of the claims of the present invention themselves either.

Section 2143.03 of the MPEP requires that for a rejection based on obviousness, all features and elements of the present invention must be taught or suggested by the prior art references. The fact that the prior art references address some of the same subject matter as the present invention, by itself, does not relieve the Examiner of these requirements of establishing *prima facie* case of obviousness. In the present case, such a *prima facie* case has not been established. Because all of the references cited by the Examiner fail to teach or suggest significant features of the present invention, the obviousness rejections are again further traversed for at least these addition reasons.

For all of the foregoing reasons, Applicant submits that this Application, including claims 1-12, is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

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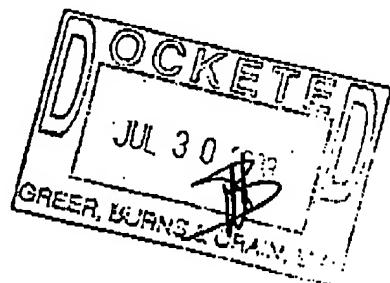
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